25 OH Vitamin D Levels of Patients Living in Isparta, Turkey

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25 OH Vitamin D Levels of Patients Livıng in Isparta

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Abstract

Aim: Vitamin D levels influence the risk of fracture, rickets, osteomalacia, and osteoporosis. Vitamin D protects the body against muscle weakness, helps regulate the heartbeat, strengthens the immune system and thyroid function, and is necessary for normal blood clotting. Vitamin D increases calcium absorption from the digestive tract, helps the accumulation of calcium in the bones and also accelerates the active transport of calcium. Humans obtain vitamin D from exposure to sunlight and from diet. Material and Method: The patients admitted to Suleyman Demirel University Faculty of Medicine Research and Application Hospital during a one-year period were examined to determine 25 OH vitamin D levels. 12,920 male and female patients were included in the study. Statistical analysis was performed with SPSS. Results: There was a significant difference between 25 OH vitamin D levels of patients in the winter season and the spring and summer seasons (<0.05). 25 OH vitamin D levels of men were significantly higher than those of women (<0.05). 25 OH vitamin D levels were low in 72.48% of all patients (<20 ng/ml). The ratio of 25 OH vitamin D levels less than 10 ng/ml was found in 40.92% of the patients. Discussion: When assessing 25 OH vitamin D levels, the season of the year and sex of the patients should be taken into consideration.

Keywords

25 OH Vitamin D Deficiency; Human

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Introduction

D vitamins play an important role in the bone metabolism and calcium and phosphorus regulation of the human body. Vitamin D levels influence the risk of fractures, rickets, osteomalacia, and osteoporosis. Vitamin D protects the body against muscle weakness. It helps regulate the heartbeat, strengthens the immune system and the thyroid function, and is necessary for normal blood clotting. Vitamin D increases calcium absorption from the digestive tract, helps the accumulation of calcium in the bones, and accelerates the active transport of calcium. Humans obtain vitamin D from exposure to sunlight and from their diet [1, 2]. Vitamin D deficiency has become a more common problem due to low sunlight intake due to indoor area life, clothing style, use of high-factor cream to prevent harmful effects of the sun, and seasonal changes [3]. Despite there being a lot of research on the lack of vitamin D and seasonal distribution in the literature, there had been no research done in the province of Isparta. This study will investigate the incidence and seasonal distribution of vitamin D deficiency in patients admitted to the SDU Medical Faculty Hospital in Isparta within a one-year period. In this study, a possible relationship between vitamin D deficiency and seasonal distribution was shown in these patients and the groundwork for new studies and research on this topic was prepared.

Material and Methods

The present study was conducted upon the approval of Suleyman Demirel University, Medical Faculty, Head of Clinical Research Ethical Committee. During a one-year period, patients were evaluated for 25 OH vitamin D levels. 12,920 patients were included in the study, 4,019 males and 8,901 females. The SPSS package program was used for the statistical analysis. The significance limit was accepted as p <0.05.

Results

There was a significant difference in 25 OH vitamin D levels between patients in the winter season when compared with the spring and summer seasons (<0.05). The 25 OH vitamin D levels of men were significantly higher than the levels of the women (<0.05). 25 OH vitamin D levels were found low in 72.48% of all patients (<20 ng/ml). The ratio of 25 OH vitamin D levels was less than 10 ng/ml in 40.92% of the patients. All results are shown in Table 1-5.

Discussion

Vitamin D is one of the most important hormones for growth, development, and healthy skeletal structure throughout life. Plants and animals exposed to sunlight have the ability to synthesize vitamin D. Vitamin D is synthesized directly under the influence of sunlight [3, 4]. When assessing 25 OH vitamin D levels, the season of the year and the sex of patients should be taken into consideration. Vitamin D levels may also differ according to the measurement method. It is necessary to compare levels with measurements made by a similar method [5]. In studies similar to ours, the regional differences are an important

Table 1. Sex * Vitamin D Levels Groups Cross Tabulation

			Vitamin D Groups			Total
			low	normal	high	
Sex	Male	Count %	2721	1258	40	4019
		within sex	67.7%	31.3%	1.0%	100.0%
	Female	Count %	6643	2158	100	8901
		within sex	74.6%	24.2%	1.1%	100.0%
Total		Count %	9364	3416	140	12920
		within sex	72.5%	26.4%	1.1%	100.0%

Table 2. Seasons * Vitamin D Levels Groups Cross Tabulation

			Vitamin D Groups			Total
			Low	Normal	High	
Seasons	Winter	Count	3056	1053	36	4145
		% within season	73.7%	25.4%	0.9%	100,0%
	Spring	Count	2741	865	31	3637
		% within season	75.4%	23.8%	0.9%	100,0%
	Summer	Count	1552	729	31	2312
		% within season	67.1%	31.5%	1.3%	100.0%
	Autumn	Count	2015	769	42	2826
		% within season	71.3%	27.2%	1.5%	100.0%
Total	Count	9364	3416	140	12920	
	% within season	72.5%	26.4%	1.1%	100.0%	

Table 3. Comparison of Sex and Vitamin D Levels

	Group Statistics					
	Sex	N	Mean	Std. Deviation	Std. Error Mean	T test p
Vitamin D	Male	4019	17.7325	12.67428	0.19992	0.001*
	Female	8901	15.4431	13.43579	0.14241	

*. The mean difference is significant at the 0.05 level.

Table 4. Comparison of Season and Vitamin D Levels Descriptives Vitamin D

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maxi-mum	Anova p
					Lower Bound	Upper Bound			
Winter	4145	16.1344	13.38538	.20791	15.7268	16.5420	2.30	95.00	0
Spring	3637	15.3236	12.75753	.21154	14.9088	15.7383	2.46	98.00	
Summer	2312	17.4557	13.51777	.28113	16.9044	18.0070	3.00	82.00	
Autumn	2826	16.1922	13.35182	.25116	15.6997	16.6847	3.00	70.00	
Total	12920	16.1552	13.24560	.11653	15.9268	16.3837	2.30	98.00	

*. The mean difference is significant at the 0.05 level.

Table 5. Season and Vitamin D Levels Comparison Post Hoc Tests

Multiple Comparisons

Dependent Variable: Vitamin D

	(I) season	(J) season	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
LSD	Winter	Spring	.81087*	.30055	.007	.2217	1.4000
		Summer	-1.32123*	.34337	.000	-1.9943	-.6482
		Autumn	-.05780	.32270	.858	-.6903	.5748
	Spring	Winter	-.81087*	.30055	.007	-1.4000	-.2217
		Summer	-2.13210*	.35185	.000	-2.8218	-1.4424
		Autumn	-.86866*	.33171	.009	-1.5189	-.2185
	Summer	Winter	1.32123*	.34337	.000	.6482	1.9943
		Spring	2.13210*	.35185	.000	1.4424	2.8218
		Autumn	1.26344*	.37096	.001	.5363	1.9906
	Autumn	Winter	.05780	.32270	.858	-.5748	.6903
		Spring	.86866*	.33171	.009	.2185	1.5189
		Summer	-1.26344*	.37096	.001	-1.9906	-.5363

*. The mean difference is significant at the 0.05 level.

factor in the incidence of vitamin D deficiency [6]. Today, vitamin D deficiency is accepted as a worldwide epidemic [7]. The demand for 25-OH D testing, and thus the cost of testing, is increasing all over the world yearly [8]. For this reason, the diagnosis of vitamin D deficiency should be made correctly. A condition that seems to be a limitation of our research is that patients who are included in the study are not aware of whether they have taken vitamin D supplementation. However, the expected low level of 25-OH D levels in all patients suggests that most patients do not receive vitamin D supplementation. The number of patients in our research is adequate and in accord with the majority of similar investigations [6, 9]. As a result of this study, when assessing 25 OH vitamin D levels, the season of the year and the sex of the patients should be taken into consideration.

Ethical Issues: The present study was conducted upon the approval of Süleyman Demirel University, Medical Faculty, Head of Clinical Research Ethical Committee.

Remarks: The present study was submitted as a poster during the XXIV International Symposium on Morphological Sciences (ISMS) held in Istanbul, Turkey, September 2-6, 2015. An abstract of the poster was published in a special issue of Anatomy Journal in 2015.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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